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July 7, 1951

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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DETROIT *me*



Helicopters Line Up

See Page 3

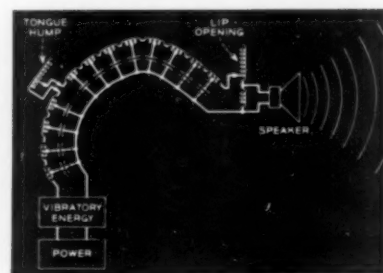
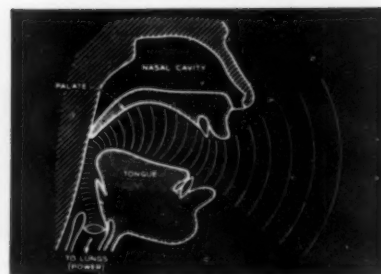
A SCIENCE SERVICE PUBLICATION

\$5.50 A YEAR

VOL. 60 NO. 1 PAGES 1-16



It tells how you talk



The machine at the left is saying "Ah!" It's the new electrical vocal system developed at Bell Laboratories. Top sketch shows human vocal system also saying "Ah!" The electrical model is sketched below it. Energy source at bottom of "tract" can emit a buzz sound, like vocal cord tone, or the hiss sound of a whisper.

No one else speaks exactly like you. Each of us uses different tones to say the same words. To study and measure *how* we make speech, acoustic scientists of Bell Telephone Laboratories built a model of the vocal system.

Electric waves copy those of the vocal cords, electric elements simulate the vocal tract, and, by adjustments, vowels and consonants are produced at pitches imitating a man's or woman's voice.

Using this electrical system, telephone scientists will be able the better to measure the properties of people's voices. Knowing more about speech they can find better and cheaper ways to transmit it.

This is another step in the research at Bell Telephone Laboratories which pioneered the exact knowledge of speech. Past work in the field is important in today's fine telephone service. Still deeper understanding is essential in planning for tomorrow.

BELL TELEPHONE LABORATORIES

Exploring and inventing, devising and perfecting, for continued improvements and economies in telephone service



BIOCHEMISTRY

New Disease Attack

Idea of "lethal synthesis" suggested as line for attack upon disease germs. Body may make seemingly harmless chemicals deadly to disease organisms.

➤ A NEW line of attack upon disease germs by "lethal synthesis" is suggested by Prof. R. A. Peters, F.R.S., biochemist at Oxford University, Oxford, England.

Prof. Peters believes investigation should be conducted with a view to discovering seemingly harmless chemicals which, as a result of enzyme action in the body, may be converted into quite different chemical substances which would be deadly to disease organisms.

He based his faith in this line of attack on recent discoveries made by himself and his colleagues that conversion of a harmless chemical into a quite deadly one does take place in at least one instance.

The chemical they investigated was fluoroacetic acid, the poisonous principle in the shrub *Dichapetalum cymosum*, a notorious killer of cattle and sheep in the Pretoria and Transvaal regions of South Africa, and also poisonous to man. The poison has a delayed effect especially upon the nervous system or upon the heart.

What puzzled Prof. Peters' group of researchers was that fluoroacetic acid by itself failed to inhibit or poison any of the body's essential enzymes when enzyme and chemical were put together in a test tube. It was only when taken into the body that extremely small quantities of the fluoride compound became toxic.

The first real clue to what was happening in the body was the discovery that when an animal suffering from fluoroacetate poisoning was killed and its body tissues analyzed they were found to contain much greater concentrations than normal of citric acid—a product in the body's vital energy-producing tricarboxylic acid cycle (nicknamed "tri-cycle" by Prof. Peters).

The kidneys were the most affected, containing about 80 times the normal quantity of citric acid. The liver and cancer tissues seem to be exceptions.

From this observation the investigators reasoned that in the body the fluoroacetate was being converted into some other chemical, now believed to be fluorocitric acid, which jammed the "tri-cycle." This caused a slowing and even stoppage of metabolism, resulting in illness or death.

It would appear that the jamming occurs at that point in the "tri-cycle" at which citric acid, one of the chain of compounds in the cycle, is due to be converted into the next compound, cisaconitate, by the body enzyme aconitase.

The fluoroacetate is probably converted by enzyme action to fluorocitrate, which is

sufficiently like citric acid to tie up the aconitase and keep it from doing its normal job of converting citric acid to cisaconitate. This throws a monkey-wrench into the "tri-cycle" works, without the normal functioning of which life can not carry on.

Prof. Peters and his co-workers succeeded in extracting the compound synthesized by the body from fluoroacetate and have shown that it is poisonous to the enzyme aconitase outside the body as well, thus clinching their case. They can now isolate it in relatively pure form by passing solutions of it through resin columns.

Since the fluoroacetate is not poisonous until it is changed into another compound by a body enzyme, it is considered an example, the first of its kind, of "lethal synthesis," or the manufacture of a deadly substance from a harmless one by the body.

If other chemicals could be found which, though harmless in themselves, could be converted by the body into substances which would poison the enzyme systems of disease germs, this would open up a whole

new field of chemotherapy. Prof. Peters believes the facts of the fluoroacetate case justify serious investigation into this new approach.

As a sidelight to his work, Prof. Peters pointed out in his Royal Society presentation, its possible application to medico-legal cases. Toxicologists might find the citric acid content of tissues a useful index in cases of suspected fluoroacetic acid poisoning.

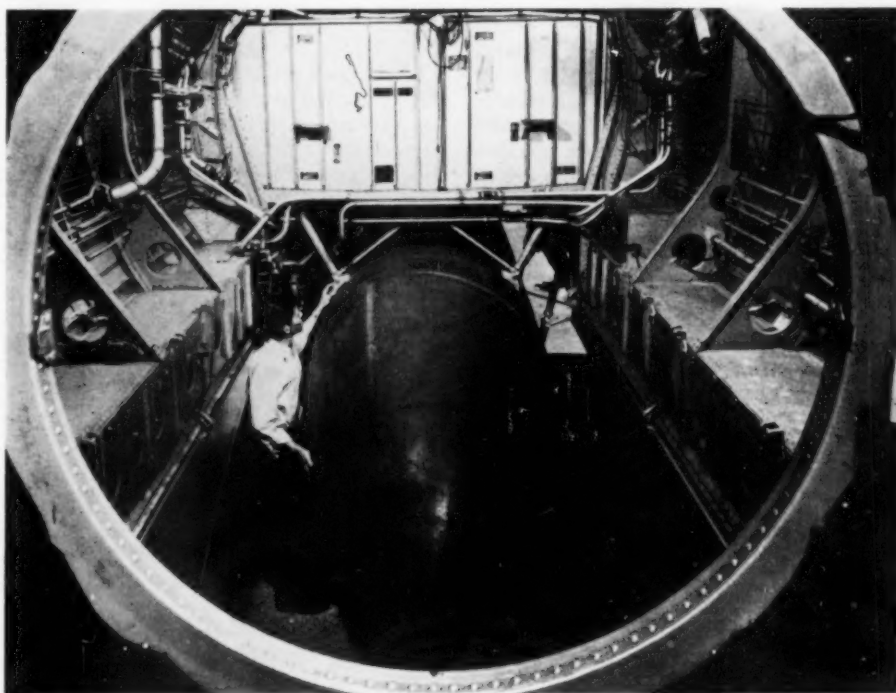
However, as the citric acid concentration begins to fall soon after death, it could only be used as proof of poisoning when immediate autopsy was possible.

Prof. Peters humorously dropped the hint that, if anyone was contemplating using fluoroacetic to poison his mother-in-law, he had better pick a Saturday to do it. By the time the coroner's office opened on Monday the citric acid evidence would be gone.

Science News Letter, July 7, 1951

On This Week's Cover

➤ LINED UP ready to begin the long journey to Korea, the Bell H-13D helicopters shown on the cover of this week's SCIENCE NEWS LETTER will fill a vital role for our fighting forces. Helicopters of this and other types have evacuated more than 5,000 wounded from the battlefield as well as performed other valuable tasks.



GIANT AERIAL BOMB—Shown for the first time, cradled in the bomb bay of a B-29, is the giant 44,000-pound aerial bomb. It is so large that it partially hangs out of the plane.

ASTRONOMY

Cosmic Dust Cloud Near

► A GIANT dust cloud relatively near the solar system blots out much of the light of stars beyond it, Dr. Bart J. Bok and Uco van Wijk of Harvard Observatory's Boyden Station in South Africa reported to members of the American Astronomical Society meeting in Washington.

This cloud cuts off all except one-fifth of one per cent of the light from one of the stars within two degrees of the large star cloud in the constellation of Sagittarius, the archer, visible in the southern sky these summer evenings. This star is relatively near us, astronomically speaking, being only about three million billion miles away.

If there were no cloud, this blue-white star would be of third or fourth magnitude and easily seen with the unaided eye, the astronomers found. The cosmic dust dims the star fully six and a half magnitudes so that a telescope is needed to spot it.

In the direction of the Sagittarius Star Cloud, only two-fifths of the light from a

star 3,000 light years away, or less than 700 times as far as Proxima Centauri, our nearest star neighbor, is permitted to pass on to the sun and earth. Only one-quarter of the light from stars 7,000 light years away gets through to the earth.

Probably two-thirds or more of this light is absorbed by cosmic dust clouds within 7,000 light years of our sun. The remaining 20,000 or more light years that separate us from the center of the Milky Way galaxy to which our solar system belongs are relatively transparent, Dr. Bok, acting superintendent of the station, and Mr. van Wijk conclude.

The Harvard astronomers have just surveyed five key sections of the Southern Milky Way, measuring precisely the colors of 106 distant stars of known color. Varying differences between the measured and real colors of these stars help them picture the obscuring dust cloud.

Science News Letter, July 7, 1951

METEOROLOGY

Dry-Month Runs Likely

► IF JULY turns out to have been an extremely dry month in any section of the country, it is a little more probable than mere chance would dictate that August will be dry too.

This finding, a step in attempts to forecast the frequency of droughts, is based on a study of 50 years of weather records at 46 U. S. Weather Bureau stations and four areas. The study was made by Drs. C. S. Gilman and J. T. Riedel, climatologists of the Weather Bureau.

If the persisting drought of the early 1930's happened by chance, Dr. Gilman told SCIENCE SERVICE, then, statistically, another similar drought should not occur

there for thousands of years. However, if there is some controlling force which tends to make dry weather persist, once it has started, then droughts will occur more frequently.

The study was an attempt to find out whether such persistence occurred. The scientists discovered that it is more likely that one dry month will be followed by another than mere chance would dictate. Their report appears in the Weather Bureau's MONTHLY WEATHER REVIEW (March).

However, the weathermen concede, they are a long way from predicting the frequency of future droughts in any precise manner. For this they blame our European

ancestors of 500 years ago and the Indians who populated this country at that time.

"If we had 500 years of weather records, instead of only 50," Dr. Gilman said, "we might be able to do the job." He believes that the long range forecasting of droughts by statistical methods will have to wait until future generations have more data.

In the meantime, other weathermen are turning to different methods of long range forecasting. One such, based on the overall circulation of the weather over the northern hemisphere, is being used by the Weather Bureau with considerable success.

Science News Letter, July 7, 1951

SCIENCE NEWS LETTER

VOL. 60

JULY 7, 1951

No. 1

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N. St., N. W., Washington 6, D. C., NORTH 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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Question Box

ASTRONOMY

For how long has August's Perseid meteor shower probably been visible? p. 7.

How are exploding stars now being spotted in the sky? p. 8.

CARTOGRAPHY

Why are topographical maps needed? p. 12.

ENTOMOLOGY

Why do most insects have six legs? p. 5.

FORESTRY

What are the advantages of hybrid trees? p. 10.

GENERAL SCIENCE

How many engineers are now needed by government and industry? p. 9.

Photographs: Cover and p. 7, Bell Aircraft Corp.; p. 3, Boeing Airplane Co.; p. 5, Wayne Taylor; p. 10, U. S. Forest Service.

MEDICINE

What is the effect of physical activity during the start of an attack of polio? p. 13.

How can trichinosis now be diagnosed simply and quickly? p. 15.

NAVIGATION

What has been characterized as the toughest problem in navigation? p. 12.

SURGERY

What operation will help women to motherhood? p. 9.

ELECTRONICS

New Cathode Ray Tube

Electronic tube using an electro-optic crystal may lead to color television based on different system of operation than present telecasts.

► A NEW cathode-ray tube that may lead to color television based on a different system of operation than that of present color telecasts is now being tested.

A cathode-ray tube is the heart of a television set, and this one, though in early development stage, makes a new color TV system appear promising.

One major obstacle needs to be overcome before work on the tube could be turned over to commercial production men. A crystal that will stand up under continuous operation must be found.

If and when the new tube is available it might be used to replace the cathode-ray tubes in present sets. The color television system would be similar to the recently FCC-approved CBS system, with the added advantage that picture size would not be limited by the color wheel size.

Physicists at the Naval Research Laboratory of the Office of Naval Research in Washington have proved that the new tube will work. But the crystal they use has a short life unless the vacuum tube in which it operates is continuously pumped out to maintain the vacuum.

"It looks now as if it will be possible to solve the crystal problem," Elias Burstein, physicist at the Laboratory, told SCIENCE SERVICE. "We expect that one way to get the crystal to stand up will be to coat the crystal we are now using with a suitable material. Then it would not be necessary to pump out the vacuum tube continuously as we must do now."

Major television companies, RCA, duMont and CBS, as well as Westinghouse, have shown interest in the project.

A light source, lenses which project the light through the tube, and light polarizers are the main parts of the new tube. The usual phosphor target is replaced by an electro-optic crystal.

An electro-optic crystal has a differing effect on polarized light, depending on whether or not an electrical field is present and on the magnitude of the electrical field. The electron beam controls the electrical field across the crystal and thus the amount of light transmitted by the tube.

The target surface of the tube is roughly one square inch. Magnification to viewing size is by a lens system, so a small color

wheel can easily be placed in the light's path. Since the size of the color wheel is independent of the image size, the lens-color system could be adapted to any suitable screen.

Drs. James W. Davisson and Paul L. Smith, and John E. Dehnell are collaborating with Mr. Burstein on the development of the new tube at the Laboratory.

Target elements used successfully to date are ammonium dihydrogen phosphate, potassium dihydrogen phosphate and potassium dihydrogen arsenate. These crystals are now widely used for pick-ups in phonograph players.

Science News Letter, July 7, 1951

ENTOMOLOGY

Balance Better, That's Why Insects Have Six Legs

► THE SEVERAL million species of the world's insects, with few exceptions, have three pairs of legs. Nature evolved the six-legged insects from many-legged ancestors because walking on two pairs of legs is not efficient for a small animal encased in an external skeleton, even though mammals get along well on four legs and man walks on two.

Dr. Urless N. Lanham, zoologist at the University of Michigan in Ann Arbor, explains this new theory of why insects have six legs by observing that the insect walks by lifting two legs on one side and the middle leg on the other. These are swept forward simultaneously and lowered together, completing a single step. The three legs on the ground furnish a tripod support while the step is taken. This maintains balance in the small creature.

A large animal walking on four or two legs has a comparatively longer time to maintain balance.

Dr. Lanham has published his new theory. (SCIENCE, June 8).

Science News Letter, July 7, 1951

PHYSICS

Can Always Find Auroras In Alaskan Night Sky

► THERE IS always auroral display in the night sky of College, Alaska, even when ordinary observation with the unaided eyes fails to reveal such northern lights.

An instrumental survey of the heavens each night since last November shows that characteristic auroral emissions can be spotted with spectroscopic cameras and can be photographed even on moon light and cloudy nights.

The survey made by the University of Alaska was reported to the American Physical Society, Vancouver, B. C., by Dr. L. Herman of the University of Paris and Dr. H. Leinbach of the University of Alaska.

Science News Letter, July 7, 1951



TRAVELING WORKSHOP—Teachers from various schools in Texas are pioneering in an educational program, the Traveling Workshop, of the Texas State College for Women at Denton, Texas. They will travel 3,400 miles this summer studying industries in 17 states. Here they inspect four kinds of tobacco at American Tobacco Company's Research Laboratories in Richmond, Virginia.

MEDICINE

Hospital for Research

Patients in unique Public Health Service hospital will be members of research team. Cornerstone laid by President Truman.

► **TOTAL WAR** against every major disease in the world will be speeded with the help of a new hospital under construction in Bethesda, Md.

President Truman laid the cornerstone for it because this special and rather unique hospital is expected to stand as a symbol of our national effort in the unending warfare against disease, disability and premature death.

The hospital's official name is the Clinical Center of the National Institutes of Health. These National Institutes, seven in number, make up the research arm of the Public Health Service, Federal Security Agency.

Patients will come to this new hospital from all over the nation. The patients will not come to have an appendix or gall-bladder removed or to get treatment for pneumonia. They will come because they have some as yet unconquered disease for which the researchers at the National Institutes are trying to find a remedy or a preventive.

The patients themselves will become members of the research team of doctors, surgeons, chemists, physicists, epidemiologists and others. Their ticket of admission will be a precise diagnosis according to a standard established for a particular disease study.

Brain and nervous and mental diseases, cancer, arthritis, heart and blood vessel diseases are the kinds under investigation at the National Institutes. These chronic diseases and diseases of aging have replaced pneumonia, typhoid fever, smallpox and other infections as our greatest disease enemies.

When the researchers at the National Institutes have worked out in the laboratories and with animals a new treatment or possible cure for some chronic, disabling disease, they need human patients for a positive, yes-or-no answer as to results the new treatment will give. These patients must be as nearly alike as possible in age, weight, sex, type and even stage of the disease under study. And there must be enough of them so that the results are numerically significant.

Few hospitals anywhere have more than a handful of almost peas-in-a-pod patients suffering from the same ailment. Development and final evaluation of new treatments therefore go slowly. When each handful of patients from hospitals around the nation can be gathered in this new research hospital, answers on new treatments are expected to come much faster.

Care of the patients of course will be

of primary importance. Dr. W. H. Sebrell, Jr., director of the National Institutes, and Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, pledge the best available in personnel and facilities for patient care. And for their greater comfort there will also be a theater, library, chapel and on every floor a dining room and solarium. Each room will be air-conditioned and have bedside telephones, radio and television outlets.

The new hospital will be the largest of its kind in the world. It will rise 14 stories, have beds for 500 patients with twice as much space for laboratories as for patient care. Opening date for receiving patients is now set for January, 1953.

Science News Letter, July 7, 1951

ASTRONOMY

Nautical Tables Accurate

► **NAVIGATORS** OF ships and planes traveling near the North and South Poles, and those who must use the sun and moon, stars and planets near the horizon for their calculations, can now rely with confidence upon the refraction tables in their nautical and air almanacs.

Within the past year navigators of 33 ships have made 315 test observations that confirm the accuracy of standard values adopted for the refraction of light passing through the earth's atmosphere. G. M. Clemence, director of the U. S. Nautical Almanac Office at the Naval Observatory reported to the American Astronomical Society meeting in Washington.

If there is any error in the theory of refraction at great zenith distances, it is so little that the calculated position of a ship would be only a few tenths of a nautical mile off, Mr. Clemence said.

Light from the sun, moon, planets and stars is often bent so much by the earth's atmosphere that we see these celestial bodies slightly displaced from their true position in the sky. Overhead light enters the atmosphere almost perpendicularly and so it is refracted little if any. It is high in the sky that navigators prefer to make their celestial observations.

At the horizon, however, the light enters the atmosphere at an angle and passes through much atmosphere, thus here the apparent displacement is great. The sun, for instance, actually is visible shortly before it reaches the true horizon in the

● RADIO

Saturday, July 14, 1951, 3:15-3:30 p.m. EDT
"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Howard A. Meyerhoff, administrative secretary, American Association for the Advancement of Science, will discuss "Loyalty and Scientific Secrecy."

TECHNOLOGY

New Oil Well Pipe Good 20,000 Feet Down

► **SEAMLESS STEEL** pipe that can withstand the tremendous pressures in oil wells over 20,000 feet deep has been developed commercially. Exceeding American Petroleum Institute specifications, it is a quenched and drawn carbon-manganese steel casing of seven-inch outside diameter just produced by new equipment of U. S. Steel's National Tube Company at McKeesport, Pa.

Science News Letter, July 7, 1951

morning, and a star can be seen when it really is below the true horizon. Thus close to the horizon, the apparent change in position must be taken into account in fixing the location of a ship or plane.

To make the test observations, each navigator at dawn or dusk determined his ship's position by observing stars at least moderately high in the heavens and thus little affected by refraction. Then with his sextant the navigator measured the actual and uncorrected altitude of the rising or setting sun. Back at the Nautical Almanac Office this measurement was compared with the sun's calculated altitude based on the position of the ship, and the figures were found to agree admirably.

Science News Letter, July 7, 1951

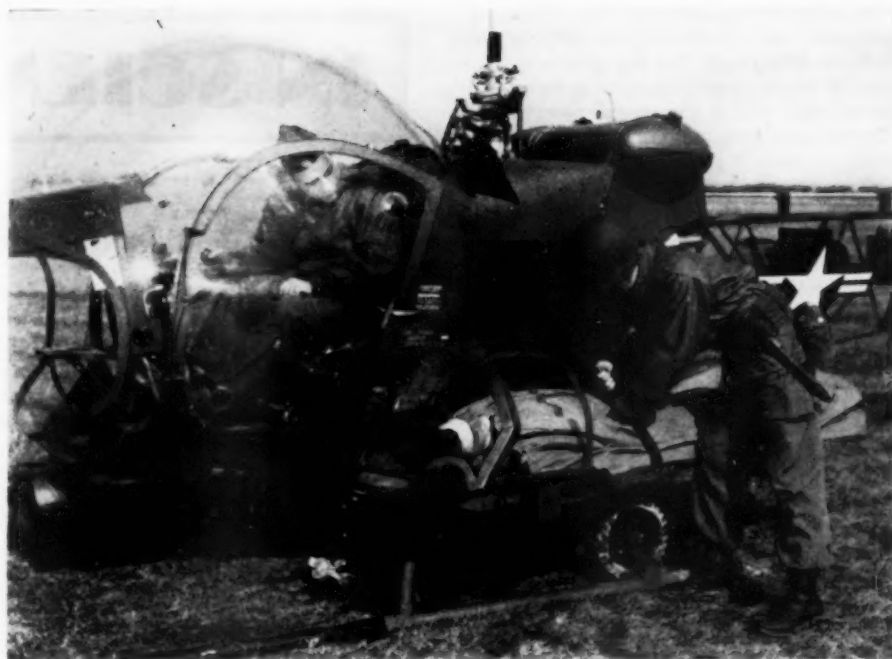
INVENTION

Soil Fertilizer Treatment Made Easy by Injection

► **TREATMENT** OF the soil with anhydrous ammonia as a fertilizer is made easy by a vaporizing and injection system which is dedicated to the free use of the American people. Inventor is Battle B. Ewing, Leland, Miss., and the patent received by him is 2,557,955.

The system includes a pressure tank for liquid ammonia, a heater in the outlet to convert the liquid to a gas, a metering device to regulate the discharge, and injection nozzles to deliver the gas into the soil.

Science News Letter, July 7, 1951



LITTER-CARRIER—For use in evacuating wounded from the battlefield, this Bell developed litter-carrier can be attached to the skid landing of a helicopter. It is designed to replace the troop-designed canvas "coffin-type" carrier used by troops in Korea.

ASTRONOMY

"Shooting Stars" Ancient

► "SHOOTING STARS" that brighten the night sky early in August have probably delighted and amazed man as long as he has troubled to look at the heavens. But in the far past the shower lasted only a night or so instead of two weeks as at present.

These cosmic bits hardly larger than grains of sand, heated by friction as they race through our atmosphere, broke from their parent comet some 40,000 years ago, Selah E. Hamid of Abbassia University, Cairo, Egypt, reported to the American Astronomical Society meeting at the National Bureau of Standards in Washington.

Tuttle's comet from which they came was last seen in 1862. It takes about 120 years to complete its elongated circuit of the heavens, and will return to the vicinity of the sun—and the earth—some 30 years hence.

This August shower of meteors is called the Perseid shower because the "shooting stars" seem to radiate from the constellation of Perseus. The glowing paths left by these burning bits are parallel, but because of perspective they seem to converge in the distance just as far-away railway tracks seem to get closer together.

The Perseid shower is expected to reach its height Aug. 12, but an unusually large number of meteors can be seen the preceding and following week. At its height, one meteor a minute can usually be spotted.

Mr. Hamid figured the path followed by

Tuttle's comet for tens of thousands of years in the past. Because its path is elongated and the comet moves in the opposite direction from that in which the planets rotate, a new method had to be developed to compute how much the giant planets pulled this comet out of its path during past visits to the sun. The Egyptian astronomer used a new method, suggested mainly by Dr. Dirk Brouwer, director of Yale University Observatory.

Exactly 343 revolutions ago the comet closely approached big Jupiter, Mr. Hamid figures, and was pulled so far out of its orbit it swung relatively close to the sun. He assumes bits of cosmic dust were blown off the comet, according to the theory developed two to three years ago by Dr. F. L. Whipple of Harvard Observatory.

These cosmic bits were scattered all around, but chiefly inward from the comet toward the sun. After a few dozen revolutions, the meteoric particles were distributed along the comet's entire orbit.

At first the meteors seemed to radiate from a small area in the heavens and the shower lasted only a day or so. Through the centuries, however, the irregular attraction of Jupiter on each particle in the orbit caused the cosmic dust to become more scattered and the shower to last two weeks as at present.

Science News Letter, July 7, 1951

BIOCHEMISTRY

Arteries Themselves Make Artery Hardening Chemical

► **CHOLESTEROL**, fatty substance presently blamed as a cause of hardening of the arteries, can come from the body as well as from food eaten. Evidence for the manufacture of cholesterol by the arteries themselves is reported by Drs. M. D. Siperstein, I. L. Chaikoff and S. S. Chermack of the University of California School of Medicine in the journal, *SCIENCE* (June 29).

The cholesterol originating in the arteries and the rest of the body may be of greater importance in the cause of arteriosclerosis, they point out, than has previously been supposed.

Science News Letter, July 7, 1951

FORESTRY

Most Serious Fire Hazard Ever Faced in Southwest

► **FOREST FIRE** hazard in the New Mexico-Arizona region and in southern California is "the most serious we have ever faced," Lyle F. Watts, chief of the U. S. Forest Service told *SCIENCE SERVICE*.

"A long drought season has put these areas in good condition for burning quickly and rapidly," he warned. Forest Service fire fighters are using the very latest techniques, including transport of workers and equipment to the scene by airplane and helicopter, to battle the blazes, such as that that raged in the Gila National Forest.

"The Forest Service is, of course, taking every possible step to spot and to stop the fires while they are still little ones, before they can grow into big ones that burn away millions of acres of forest every year," the chief forester stated.

Science News Letter, July 7, 1951

INVENTION

Self-Lubricating Metals Used in Machine Bearings

► **BEARINGS** IN instruments and machines need no oil with a self-lubricating metal alloy on which patent 2,588,523 was awarded to Paul E. Luther, Olean, N. Y. The alloy, by weight, is about 67% copper and, 16% lead, 11% tin, 6% German silver, and tiny amounts of antimony and phosphorus copper. It is put together in a flux containing borax, yellow soap, sulfur, and a fatty substance such as a slab of butter.

Castings produced from this self-lubricating bronze, as it is called, are readily machinable to a fine, satin-like surface structure. Bearings made of the bronze will operate with equal efficiency in extreme high or extreme low temperatures. They are not affected by steam or moisture and will not sweat.

Science News Letter, July 7, 1951

GERIATRICS

Four-Point Program To Care for Aged

► A FOUR-POINT program for mobilizing community medical resources to care for the aged is suggested by Dr. Robert T. Monroe, clinical associate at Harvard Medical School and head of the geriatric clinic at Peter Bent Brigham Hospital, Boston. The four points are:

1. A geriatric, or old-age, clinic for the study of diseases and disabilities found in old people.

2. A convalescent type of nursing home, "whose work should be effective enough to keep down the need for custodial-care nursing homes."

3. Home care supervised by hospitals.

4. A chronic ward in each general hospital—to free beds in the acute wards for old people who need surgery and special attention.

Most old people are "normal" in all essential respects, Dr. Monroe says in his new book, "DISEASES OF OLD AGE," published by Harvard University Press.

A large share of the deterioration that has been attributed to old age comes from states of unfitness brought on mostly by idleness, Dr. Monroe finds. "Disuse of the learning process" also adds to the unfitness and deterioration of old people.

Unlike a generation ago, those who reach the age of 65 today have a life expectancy long enough to make it worth while for them to undertake with confidence the pursuit of long-range programs.

With these facts in mind, Dr. Monroe suggests, among other measures, that communities should have schools for the retraining of old people in order to fit them into jobs that are open when they are forced to retire from the work they have previously been doing. Both business and labor groups might sponsor such schools.

Science News Letter, July 7, 1951

ENGINEERING

Silicone Resins Produce Better Electric Insulation

► A RELATIVELY new and superior insulation for electrical uses, already in volume production, was discussed at the meeting of the American Institute of Electrical Engineers in Toronto, Canada, by M. L. Manning, Pennsylvania Transformer Company, Canonsburg, Pa.

He described this insulation as organic materials, such as glass, porcelain, mica, asbestos, bonded or impregnated by the silicone resins or rubbers, or by the fluorocarbons. It is known as "Class H insulation" by the Institute. The main difference of this insulation from others lies in the resins and varnishes used as bonds and impregnants:

Particularly discussed by Mr. Manning were the uses of silicone-glass fiber or asbestos combinations. Among other superior uses of this type of insulation is its use on submarine rotating equipment operating at 230 degrees Centigrade continuous temperatures, he said. It constitutes no health hazard up to 96 hours operating time submerged.

He added that the Navy Department and motor manufacturers have tested Class H insulation on electrical equipment and found such equipment capable of operating hundreds of times longer than conventional insulations.

Science News Letter, July 7, 1951

INVENTION

Improved Arc Welding System Earns Patent

► AN IMPROVED arc-welding system brought William L. Roberts of Pittsburgh, Pa., patent 2,588,102. Westinghouse Electric Corporation, of East Pittsburgh, has secured the patent rights by assignment. It is an arc initiating and stabilizing system, inexpensive to manufacture and effective in operation.

In the system the arc welding circuit, energized from a relatively low voltage continuous current source, provides separate and distinct impulses at relatively widely spaced intervals of time to initiate and stabilize the arc.

Science News Letter, July 7, 1951

INVENTION

Chemicals Help Soil Spread Lightning-Rod Electricity

► GREATER SAFETY from lightning is promised with a soil-treatment process that makes the earth around the ground wire from the lightning rod a better distributor of collected electricity.

The same chemical treatment of the soil is of value also in grounding television antennas, radio transmitters, power lines and transformers. It can be used in the electrolytic protection of pipe lines. The inventor is Ivar Harry Sanick, Stockholm, Sweden. He received patent 2,558,159.

Clay soils, and others containing considerable humus, are satisfactory conductors to dissipate any electrical charges on the ground wire. But sandy and gravelly soils are not. It is particularly for such soils that the treatment is recommended.

The process consists of injecting into the soil in the vicinity of the buried electrode on the end of the ground wire chemicals that form a type of gel which is a good conductor of electricity. The gels recommended for the purpose are those made from soluble salts of copper, nickel or cobalt with soluble ferro- and ferri-cyanides.

Science News Letter, July 7, 1951

IN SCIENCE

GENETICS

Fat Mice Have Hereditary Diabetes

► SCIENTISTS NOW know that diabetes can be inherited, thanks to a new kind of obese, or very fat, mouse. The obesity is inherited and with it goes an inherited diabetes. Reporting their findings to the journal, *SCIENCE* (June 29), Dr. Jean Mayer, Margaret W. Bates and J. J. Vitale of Harvard School of Public Health, and Miss Margaret Dickie of the Jackson Laboratory, Bar Harbor, Me., state:

"For the first time the existence of hereditary diabetes, clearly independent of environmental influences, has been established."

The fat, diabetic mice when given a choice will follow the kind of high fat, low carbohydrate and high protein diet often prescribed for human diabetics. They are resistant to insulin and often have ulcers not unlike those seen in fat human diabetics.

Science News Letter, July 7, 1951

ASTRONOMY

Exploding Stars Found By Limited Sky Searching

► A NEW technique is being used successfully to hunt "exploding stars." Within four months last fall it led to the discovery of three novae in the Milky Way, a good record as only about a hundred "new stars" have been found during the past two centuries.

Instead of looking for "exploding stars" throughout the entire sky, Dr. E. R. Herzog and Prof. Fritz Zwicky of the California Institute of Technology, Pasadena, picked out 16 areas where novae have been found most often. They include the constellations of Scorpius, the scorpion; Sagittarius, the archer and Aquila, the eagle.

All three novae were found in Scorpius. These same novae were found independently by Dr. G. Haro of Mexico's Tonantzintla Observatory.

Spectral photographs of eight areas were made each night and the rest every other night for three weeks of every month between July and October last year. The 18-inch Schmidt-type telescope was used, the astronomers report in the *PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC*.

In examining the photographs, they put a new film slightly off-center over an old one of the same area, and studied the pair with low power binoculars. Exploding stars showed up as images where no corresponding image was visible on the old film.

Science News Letter, July 7, 1951

ENE FIELDS

SURGERY

Plastic Operation Helps Women to Motherhood

► **WOMEN WHO** can not have babies because their Fallopian tubes have become blocked can be helped to motherhood by a new plastic operation involving the use of polyethylene plastic tubing, Drs. Mario A. Castallo, Amos S. Wainer and John M. Stack of Jefferson Medical College and Hospital, Philadelphia, reported to the American Medical Association meeting in Atlantic City, N. J.

The Fallopian tubes are the ones down which the ova or eggs travel to the uterus. Infection and various other conditions may cause blocking of these tubes. Sometimes the blocking exists at birth.

When the blocked portion of the tube is cut out, a small piece of the polyethylene tubing will bridge the gap satisfactorily until the cut ends of the tubes grow together, when the plastic is removed.

Other materials that have been used for this purpose such as steel wire, catgut and whalebone either cause inflammation and more blocking or do not stay in place long enough to let the tubes regenerate.

Although they have been working on this new technique for two years, Dr. Castallo and associates have worked chiefly with rabbits. But other doctors have reported to them that their patients have become pregnant.

Science News Letter, July 7, 1951

MEDICINE

Mix Sense with Sunshine For Summer Health and Fun

► **MIX COMMON** sense with the sunshine you take for health, fun and beauty this time of the year. If you try to get all your tan in one big day at shore or mountains, you are likely to end up with long hours of suffering and no tan.

Many people forget that a burn is a burn, whether it comes from an atom bomb explosion or the sunshine. Blistering is a sign of a second degree burn. How sick you get when you are burned to blistering will depend on how much of your skin is that seriously burned. You can suffer shock from sunburn as well as from other kinds of burns.

The sensible way to get an enviable coat of tan plus the health benefit of the sun's rays is to take sunshine in small doses at first. Start with only a few minutes the first day and increase the dose by just a few minutes each day.

If you use one of the creams or lotions designed to protect against sunburn, remember that it will rub off, dry off and be washed off when you go in the water for a cooling dip or swim. So do not count on one application to protect you for too long a time.

Never look directly into the sun, no matter how dark your sunglasses, warns the National Society for the Prevention of Blindness. No glasses can keep out all the burning ultraviolet rays of the sun and these rays can actually burn the retina of the eye, causing permanent damage.

Be extra careful driving home at night after a day at the beach. Your eyes may be temporarily more sensitive to light, which means you cannot see as far at night as you ordinarily could. If you are driving 40 m.p.h. you could stop your car in 126 feet. This means you would avoid hitting an object just visible 130 feet away. But if the sun has temporarily weakened your vision so that you can only see the object 109 feet away, you may not be able to stop in time.

Science News Letter, July 7, 1951

EDUCATION

U. S. Summer School in Guatemala Highlands

► **THIRTY TULANE** University students, accompanied by six professors, are attending a special summer school in Guatemala's highlands.

This is the first time that a group of students have gone from the United States to Central America for summer school sessions. The school has headquarters at Guatemala's second largest city, Quezaltenango, in the northwest section of this Republic's highlands.

Most of the students are taking advanced courses in anthropology. Guatemala's historic San Carlos University and the U. S. Embassy are cooperating. After inspecting ancient Mayan ruins in and around the Guatemala City area, they are staying at Quezaltenango for approximately a month.

The summer school itinerary and plans include field trips to various sections of northwest Guatemala for the purpose of studying the many Indian tribes in that area, most of which are Mayan in origin and live under primitive conditions little changed in the past 500 years.

In order to talk to the Indian population, native interpreters will be needed. About 40% of Guatemala's population speak no Spanish and are limited to one of the 17 Indian dialects, stemming from the three major Indian languages used. The languages have no similarity to Spanish and apparently originate from Mayan and Aztec languages.

Plans for the summer school session were made by members of Tulane University's faculty, including Dr. W. J. Griffith, chairman of the School of Latin Studies.

Science News Letter, July 7, 1951

PUBLIC HEALTH

Younger Generation Gets Praise for Brains, Maturity

► **TODAY'S YOUNGER** generation of Americans were praised as an "astoundingly sound and intelligent group of young citizens" in a report to the American Home Economics Association meeting in Cleveland.

The raised eyebrow "what are we coming to" attitude of oldsters toward youth is no longer justified, it appears from the report by Dr. Bernice Milburn Moore, Texas mental health consultant and educator.

"Far fewer young men and women are escaping into boredom in 1951 than in 1921," she declared.

"Families and schools, churches and communities, have done well by their youth," she stated, pointing out that "no group of young men and women have been handed such knotty international problems. No group of young persons have come to majority in a time when contention within the nation was more intense. No group of young persons have faced such impermanence in their personal lives."

"Yet those who are 'running out' on what the world offers are at a minimum. Few in comparison are the youth who are seeking release in unsocial behavior. Scapegoat hunters and name callers are not many in the younger years of maturity. Fanatics—the most dangerous escapists of all—are found in the main later age categories."

Dictatorial relationships in families have not been eliminated and authoritarian schools are not extinct, she said. However, amazing strides have been made and are being made in democratic living, often with the help of public schools, universities, and colleges.

Science News Letter, July 7, 1951

GENERAL SCIENCE

Government and Industry Short 60,000 Engineers

► **MORE THAN** 60,000 engineers will be needed by government and industry, even after this year's June graduates have all started working.

A just-completed survey of over 378 companies and government agencies showed this shortage, Carey H. Brown, chairman of the Engineering Manpower Commission of the Engineers Joint Council told members of the American Society for Engineering Education meeting in East Lansing, Mich.

He blamed the increased demand for engineers on mobilization needs and on the extreme advances in technology in the last several years. Engineering graduates will not be so numerous in the coming years, he predicted. Although this year's classes furnished 38,000, only about 26,000 are expected next year, with the number falling off to about 12,000 in 1954.

Science News Letter, July 7, 1951

FORESTRY

New Kind Of Green Gold

Man is now making new kinds of trees. The Forest Service's Institute of Forest Genetics is breeding trees to grow faster, to be resistant to disease and drought.

By NEIL HUNTER

► MAN IS now making new kinds of trees. The old, established kinds don't suit him any more. They grow too slowly, or they have too many branches, or they succumb too easily to disease or drought.

So man has started to create trees which will not have such failings. During the 1940's we produced 12 new varieties of pine alone.

The U. S. Forest Service says: "Soon there will be hybrid trees that may grow to harvesting size in one half or one third the time required for a good non-hybrid timber tree to reach the same size. Our forests and farm wood lots might then be made to produce twice or three times the volume of timber that would be produced by planting standard stock or by natural growth."

There is no exact tabulation of the dollar value of the lumber production of the United States, but it runs certainly to several hundred million dollars. To double it is to add several hundred million dollars to our national income. The significance of the new development is thus difficult to exaggerate. The Mecca of this work is the Institute of Forest Genetics of the U. S. Forest Service, in Placerville, Calif. More than 60 different species of pine are now growing on the 106 acres of Institute grounds. It is exciting to walk around the Institute. In long rows, lodge-pole pines six years old reached just above my knees. But growing next to these rows were the new hybrids. The same age as the parent species, they towered four inches above my head.

Dust Pollen, Then Collect Seeds

To create a new tree by controlled breeding the tree scientist selects the pollen from a desired pine, dusts it on the conelets of the tree he wants to use as the "mother," and, in time, collects and plants the fertilized seeds. From these seeds the new hybrids sprout. Many hybrid plants will not reproduce themselves. But among all the hybrids produced to date in the tree laboratories of the world, every one has reproduced itself when old enough.

Merely placing the pollen of one tree on the conelet of another sounds easy. In fact, this breeding is intricate work. Since only the desired pollen may reach the conelet to be bred, the conelets of the chosen tree must be covered with bags to exclude all air-borne pollen. And since pollen, like

smoke, gets in everywhere, the bags must be fine enough to keep foreign pollen out, but porous enough to allow moisture to evaporate. Each bag has a transparent plastic window, and is lashed to the branch with cotton cord over cotton batting.

Placing the bags over the branches of a tall pine is no mean feat. The men cannot use spikes lest their repeated journeys up and down a tree injure its bark. So they climb up ropes with monkey-like speed, using what they term a "footlock."

The Placerville experiments stem back two decades. In the early 1920's, James G. Eddy, a successful lumber man in Seattle, became worried because the nation was cutting its forests faster than they could grow back. Was it possible, he wondered, to develop trees which would grow fast enough to make up the difference—trees which would come to harvestable maturity in 50 years, instead of 75?

Mr. Eddy went to Luther Burbank, whose achievements in developing new types of flowers and vegetables were then headline news. After some study, Burbank responded with enthusiasm: there seemed no reason why trees could not be crossed and bred for improvement in certain qualities.

So Mr. Eddy started clearing land and collecting tree specimens. He and his asso-

ciates chose Placerville after studying climate, soil, altitude and accessibility of sites all over the nation. They realized they would have to narrow the huge field of possible research and chose pines, because there are 90 definite species, and they grow from sea level to 10,000 feet, from the tropics to the Arctic Circle, in giant size and in shrublike bushes. Also, their commercial importance is outstanding.

They chose fast growth as their goal because economically that seemed to be the most urgent factor. In 1935 Mr. Eddy decided over the entire project to the people of the United States. The U. S. Forest Service administers the program, to insure its long-range continuity.

Work Repeated to Eliminate Chance

In Supervisor F. I. Righter's office at the Institute large charts, squared off into all the possible hybrids or cross-breedings of the 64 varieties of pine on the experimental station, show a tally of 23% success, which in this work is high. But whether the cross is a success or a failure the process is repeated several times to eliminate chance.

What does "success" mean? One hybrid at three years is more than twice as high and three times as heavy as the better of its parent species. And this ratio continues; at ten years the parent species are six feet, the hybrid 12 feet tall. Crossing the poorly formed jack pine of the Lake States with



FAST-GROWING HYBRID—Although these three trees are each four years old, the hybrid in the center shows the fastest growth. It is a cross between the Jeffrey pine on the left and the Coulter pine on the right.

the straight-growing lodge-pole pine of the Sierras produces a newcomer as straight as the lodgepole but with 88% faster growth at 10 years of age.

As do all hybrids, vegetable and animal, hybrid trees assume an increase in vigor when the cross-breeding is successful. At four and one-half years, the cut-off top of a large but not the largest hybrid weighed three and a quarter times more than the better parent.

Branch-Free Trees

But fast growth is only one of the benefits of controlled tree breeding. For many lumber uses and for veneers and plywood, wood free from knots is desired. The fewer the branches on the trees the better. There are young trees at Placerville which are almost entirely devoid of branches. One Canary Island pine put up a trunk 15 feet 8 inches high, in three years, without a single side branch breaking its sheer, pipe-like column.

By careful selection, geneticists now develop trees which can withstand the age-old enemies of our forests. The pine reproduction weevil kills young trees in incredible quantities. Of one planting in Lassen National Forest it killed 95% of a stand of 15-year-olds. But a backcross of Jeffrey pine and Coulter pine laughs at the weevil and has improved wood qualities. (A backcross is a straight cross followed by a cross between the hybrid and one parent.)

Against another enemy—drought—the new hybrids are making headway. The knobcone pine and the Monterey pine of the West make a splendid pair. Their progeny combine in remarkable degree the drought-resistant ability of the knobcone pine with the fast growth of the Monterey. At 22 years it grows to more than 70 feet. On the Institute's nursery grounds, I was shown an experimental baby tree which promises to be proof against the driest weather. A year-old hybrid pine, Ponderosa-Apache, stood only a couple of inches high but its root system already went 36 inches into the earth.

Rust-Free White Pine

Every year blister rust kills off unprotected young American white pines by the thousands. The annual cash loss to the lumber industry is tremendous. The Balkan white pine is resistant to rust. Crossed with the white pine, it produces a desirable hybrid apparently free from the rust menace.

This valuable discovery was made, in fact, not in Placerville, but in the Royal Botanical Gardens of Denmark, by Dr. C. Syrach-Larsen. It was in those Danish gardens that I first heard of our American Institute.

"Why do you come here," asked my guide, "when you in America are doing the most remarkable work of all nations?"

When I checked through the guest register at Placerville recently I found that in the preceding nine months, scientists had visited there from Italy, Sweden, Turkey,

Finland, Greece, New Zealand, England, Israel, France, Japan, and South Africa.

Each nation is specializing in the kind of wood it needs most; Swedish scientists are working on aspen for paper pulp and pine for construction; the Danes on indoor techniques for dwarfing fruit trees, forcing early flowering and grafting imported scions on potted stock. Canada is deep in hybrid pine work, and poplar for pulp. Germany is doing research into speed of growth. Australia and New Zealand, which need trees, are interested in importing and acclimatizing foreign species.

The eventual aim of the experimenters is to get seed of the new type of tree into the hands of big planters for reforestation. The reforestation which goes on constantly in the United States is tremendous. One company reforests 5,000 acres a year, another has planted 90 square miles in Louisiana; members of the West Coast Lumbermen's Association plant up to 15,000 acres yearly in their certified tree farms.

Plantings With Wild Seeds

All this planting is being done with wild seed. No other has been available. Nor is the hybrid seed available in quantity now. "We're just about where the hybrid corn development was in the 1930's," said one Placerville scientist. "Principles and techniques have been worked out, a number of strains have been produced, and the next step is to make the seed available."

"If we have put forth so much effort to develop the desirable strains of one-year crops," said the late Director William Crocker of the Boyce Thompson Institute for Plant Research, "how much more attention should we give to developing the strains for crops like forest trees. The planting of a poor strain of an annual crop means the loss of only one year's investment. The planting of a poor strain of forest trees means the loss of 40 or more years' investment."

One of the top experts in the lumber industry calculates that the trees which are being brought into being at Placerville will cause an increase of \$18,500,000 a year in the annual income from the certified West Coast tree farms alone. That is, of course, envisaging the day when the 3.7 million acres of those farms will have been planted in the new varieties.

The possible rewards to future generations of the Placerville experiments are such as to stir any imagination. Robert H. Dart, of Sacramento and Placerville, has known the west and trees for half a century, as cowboy, timber cruiser, and bigtime business manager in the fruit industry. He says:

"When FDR first proposed planting trees on the western plains, I classed the idea as a prime example of New Deal fantasy. Having for 25 years studied the work of the Institute, I am now convinced that great forests can be grown on the barren plains, and grown to commercial value in less than one human lifetime."

The yellow dust that is gold was discovered in 1848 just a few miles from Placerville. The town took its name from the rich placer mining that went on there. Pollen dust looks like a very fine gold dust. Many competent observers think that from the nation's point of view, Placerville's second yellow dust will be as rich as its first.

This article was prepared for SCIENCE NEWS LETTER in cooperation with the Reader's Digest. It will appear shortly in that magazine.

Science News Letter, July 7, 1951

INVENTION

Patent Suction Brush to Clean Venetian Blinds

► FOR THE housekeeper is a suction brush to clean venetian blinds. It is an attachment for the ordinary vacuum cleaner. This accessory has a jaw in which there are two brushes facing each other. The slat of the blind to be cleaned is put between them. The combination of the brushes and the suction assures efficient cleaning. Patent 2,558,253 was awarded to Julian M. Ines, Goshen, N. H., for this invention.

Science News Letter, July 7, 1951

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Yankee Mockingbird

► THE MOCKINGBIRD is the chief boast of all southern birddom, and justly so. He is an excellent songster and possessed of an exceedingly varied repertoire.

But though the North is not blessed with the mockingbird, it has an almost equally talented cousin of his in the catbird. The mockingbird and the catbird look a good deal alike, being slim, long-tailed birds of a general gray color scheme, and they have the same habit of ducking in and out among the branches when you try to get a good look at them; not flying away, but keeping inconvenient bunches of leaves between themselves and the would-be observer.

The cousinship is most clearly traced through the catbird's song. This mockingbird of the North has an assortment of notes of his own and of imitations of other sounds, that fairly rival the stock of his more widely reputed cousin in Dixie. There are even some loyal Yankees who prefer the catbird. And, indeed, if it were not for the mewling call he sounds when excited or alarmed, the catbird might well have been formally named the Northern Mocker.

That catcall is the most realistic imitation in nature, though it is not a deliberate

imitation. Catbirds were using it long before white men came to America and brought their pets with them. But it is so much like the voice of a somewhat distressed kitten that it will fool even a cat.

But let not cat presume on a similarity of language and try to get familiar. The catbird, like the mockingbird, has a decidedly combative streak, and will turn himself into a low-flying strafing combat plane if anybody, no matter how big, gets too close to his nest.

The true Southern mockingbird is an artist, and his song is not merely a means to a living but an end in itself. He will tinkle and coruscate and whistle his own scintillating music, and for variety ring in bits from the repertoires of other birds, with catcalls and rusty-hinge squeaks by way of scherzo interludes.

Science News Letter, July 7, 1951

CARTOGRAPHY

Need Topographical Maps

► THE IMMEDIATE need for accurate topographic maps for the entire United States was strongly emphasized at the American Congress on Surveying and Mapping meeting in Washington. Most modern methods of making such maps, combining aerial photography with land-surveying methods, were discussed by experts from federal, state and university offices.

Such maps are essential in any program having to do with the construction of state and federal highways. But they are also needed in the effective development of mineral and water resources, the effective use of soil, the location of dam sites, industrial plants, electric lines, radio transmission stations, reclamation and drainage projects and many other uses concerned with the surface of the earth.

Map-making from photographs taken from airplanes can no longer be called a new process now after about two decades of use, but many new instruments have been developed to make the results more accurate. Important among them is a method of making automatic profiles by use of a new radar altimeter.

The basic principle in utilizing an airborne altimeter for obtaining elevations involves the use of a constant pressure altitude for a datum, and of measuring by electronic means the distance to the terrain as the plane moves along the profile track, the meeting was told by Vernon F. Reynolds of Aero Service Corporation, Philadelphia.

Two types of instruments are used. One is a radio-altimeter, based on frequency modulation and used as a low-altitude clearance indicator. The other is a radar type which uses the echo principle and is primarily for high altitude pressure flying.

GEOLOGY

Probe Origin of Two-Mile Wide Crater in Canada

► WHETHER A two-mile wide crater in barren northern Quebec near Hudson Bay was actually made by a gigantic plunging meteorite should be discovered this summer.

A joint U. S. -Canadian expedition headed by Dr. Victor Ben Meen, director of Toronto's Royal Ontario Museum, backed by the National Geographic Society, is to fly to the site and explore the scar in the earth that resembles the craters of the moon.

Mine detectors and other modern scientific instruments are to be used in determining the origin of this spectacular crater, discovered by Frederick W. Chubb, a prospector, and first visited last year.

Science News Letter, July 7, 1951

A new radar altimeter designed for topographical surveying has been developed, he stated. One feature is its accuracy. This altimeter also permits the making of a continuous strip chart recording the radar height of the plane, the aircraft variation from the constant-pressure altitude, and the radar height to the selected constant-pressure altitude.

Science News Letter, July 7, 1951

NAVIGATION

Guided Missiles Toughest Problem in Navigation

► GUIDED MISSILES that must find their way to distant targets with great speed and accuracy present the most challenging problems in navigation today, Dr. Paul Rosenberg, New York consulting physicist, told the Institute of Navigation meeting in New York, speaking as its president.

Not only will the guided missile cause the most significant advances in navigation in the future, but, Dr. Rosenberg said, "it is destined in all probability to be the most important single type of weapon in any armed world conflict of the near future."

The guided missile depends for its effectiveness upon its ability to get to a munitions depot thousands of miles away, or a ship at sea, or another guided missile traveling at speeds measured in thousands of miles per hour.

No longer is the sextant the most representative symbol of navigation, Dr. Rosenberg said. The navigation of the future should not be symbolized solely by an electron tube, because modern navigation in the air, on the sea and land utilizes many sciences and techniques.

Science News Letter, July 7, 1951

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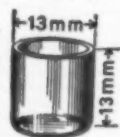
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MEDICINE

Long Transport Hard

Polio patients may be harmed by long distance travel to hospital when disease is acute. Physical activity during polio's start may not increase paralysis.

► TRANSPORTING POLIO patients long distances to the hospital while they are in the acute stage of the disease may be harmful. But physical activity shortly before or during the start of the illness, except in grown-ups, does not lead to more severe paralysis.

These findings, the last one contrary to previous widely held medical opinion, are reported by two different groups of investigators in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 30).

The report on physical activity is from Dr. Robert M. Albrecht and Mrs. Frances B. Locke, biostatistician, of the New York State Department of Health. The one on transportation is by Dr. M. Bernard Brahdy of Mount Vernon, N. Y., and Dr. Selig H. Katz of New York City.

Dr. Albrecht and Mrs. Locke studied 200 polio patients in Nassau County, N. Y., who were stricken during the 1949 epidemic. To determine the amount of paralysis in those who recovered, muscle grading according to the standards of the New York State Health Department and the National Foundation for Infantile Paralysis was done from five and one-half to seven months after the start of the illness.

Among 77 patients aged three to 49 years who had normal to heavy activity the day the illness started, 53.2% had light or no paralysis about six months later. Normal to heavy activity ranged from housework, office work, school and normal play to manual or strenuous sports or play.

Among 39 who rested at home the day the illness started, classed as light activity, 71.8% had light or no paralysis. And of 67 who were in bed the day the illness started, 71.6% had light or no paralysis.

Of 24 who died, 10 had restricted activity the day meningeal symptoms, such as headache and stiff neck, started.

"Deaths and severe paralysis in children are not related to the degree of physical activity either shortly before the onset of illness or at any time during the illness," Dr. Albrecht and Mrs. Locke conclude.

"Deaths and severe paralysis in adults," they add, "may be attributed in part to the degree of physical activity in the meningeal stage."

Grown-ups, however, are more apt than children to continue their routine activities when ill, the scientists point out. They believe age is a major factor in the outcome of polio and that grown-ups, irrespective of activity, are more severely affected than children. However, they conclude that

"factors other than age and activity are of major importance in the prognosis of poliomyelitis."

The harmful effects of long transportation, reported by Drs. Brahdy and Katz, were found in a study of 493 patients admitted to Willard Parker Hospital, New York, from June 13 to Oct. 31, 1949. The 380 patients from within New York City traveled an average of seven miles to the hospital. The 113 patients transported to the hospital from outside the city traveled an average of 85 miles. The median distance was 70 miles.

The fatality rate for patients transmitted long distances was three times that of the local patients. For patients who had bulbar or encephalitic poliomyelitis, the fatality rate was almost twice that of the local group.

From information obtained about the patients, there was no evidence that the more seriously ill patients outside the city were selected for transportation. They came from vacation spots where adequate facilities for their care were lacking, from orphanages, and from an area where a small contagious disease hospital did not have room for all the patients brought to it. Most of the seriously ill patients in this group were kept in the small hospital. The less seriously ill were the ones transported.

Whether treatment of patients during the acute stage of polio should be decentralized or whether methods of transportation should be improved are problems which Dr. Brahdy and Katz state require further study.

Science News Letter, July 7, 1951

ECOLOGY

Scientists Study Life On Remote Coral Atoll

► ONE OF the most isolated inhabited areas of the world, Onotoa coral atoll in the southern Gilbert Islands, is being visited by a team of American scientists this summer.

All the living things, including the 1,500 natives, will be studied in relation to the uninviting conditions that exist on this bit of land of little rainfall.

Because there are only brackish wells for drinking water, aside from the liquid in coconuts, the Pacific Science Board of the National Research Council is sending an experimental solar still along with the party. It can convert five gallons of salt sea water into fresh drinkable water each day.

Other equipment transported by U. S. Army, Navy and Coast Guard for this Office of Naval Research-financed expedition include: four diving outfits with oxygen supplies for underwater work, fathometers for sounding the depths of the lagoon, outboard motors and emergency radio equipment.

Dr. Preston Cloud of the U. S. Geological Survey heads the party, which consists of Dr. Albert Banner, University of Hawaii, Dr. Ward Goodenough, University of Pennsylvania, Dr. Edwin T. Moul of Rutgers University and two University of Hawaii graduate students, Donald Strasburg and John E. Randall, Jr.

Science News Letter, July 7, 1951

INVENTION

Cross Wind Landing Gear Simplified and Improved

► SIMPLIFIED AND improved airplane landing gear which permits landings on runways criss-cross with the wind brought John Harlin Geisse, Washington, D. C., patent 2,557,275.

In this new landing gear only one of the two main wheels is turned in the direction of the runway. The other remains in a position parallel to the axis of the plane whose nose is headed into the wind. In older cross wind landing gears all three wheels are turned in the direction of the ground movement along the runway.

It is the downwind wheel that is turned. This wheel guides the plane along the landing strip. The other main wheel plays but a minor part. Pressure of the wind on the plane tends to raise the side against which it blows, thus taking weight off the upwind wheel and decreasing traction between it and the runway.

Science News Letter, July 7, 1951

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Books of the Week

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AN ADULT EDUCATION PROGRAM FOR ORISSA, INDIA—William Cyrol Osgood—*Oregon State College*, 118 p., paper, \$1.00. What is needed to instruct the people of this part of India in reading and writing and the means for living and fighting off starvation and preventable disease.

BACTERIOLOGY—Robert E. Buchanan and Estelle D. Buchanan—*Macmillan*, 5th ed., 678 p., illus., \$6.00. In this edition particular emphasis is given to modern developments in cellular morphology and physiology and to the many technologies in which microorganisms are significant.

BETTER NURSING: A Study of Nursing Care and Education in Washington—Jean A. Curran and Helen L. Bunge—*University of Washington Press*, 174 p., paper, \$3.00. Report of a study by an Advisory Committee of the University of Washington.

THE CAROTID ARTERIES IN THE PROCYONIDAE—H. Elizabeth Story—*Chicago Natural History Museum*, 78 p., illus., paper, \$1.00. One of a series of studies being made in conjunction with work on the giant panda.

EDWARD KREMERS MEMORIAL LECTURE—George D. Beal—*Mellon Institute*, 13 p., paper, free upon request to the publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa. Sponsored by Rho Chi Society and reprinted from the American Jr. of Pharmaceutical Education, this lecture honors a pharmaceutical scientist, Edward Kremers.

GEOLOGY OF THE SAN JOSE-MOUNT HAMILTON AREA, CALIFORNIA—Max D. Crittenden, Jr.—*California Division of Mines*, 74 p., illus., \$2.00. The sedimentary rocks of the area range in age from Upper Jurassic to Recent; all of them strongly folded and faulted.

INTRODUCTORY CHEMISTRY: For Students of Home Economics and Applied Biological Sciences—Lillian Hoagland Meyer—*Macmillan*, 532 p., illus., \$5.00. Intended to remove the fear of chemistry on the part of students who intend to take one year and very little more.

INTRODUCTORY COLLEGE CHEMISTRY—Harry N. Holmes—*Macmillan*, 5th ed., 594 p., illus., \$4.75. Atomic energy and fission are given

much more extended treatment in this edition and even the possible hydrogen bomb is briefly discussed.

THE MEASUREMENT OF LINKAGE IN HEREDITY—K. Mather—*Wiley*, 2nd ed., 149 p., \$1.75. A revised edition of this book by a British author on statistical and mathematical methods for the geneticist.

THE MEDORA SITE, WEST BATON ROUGE PARISH, LOUISIANA—George I. Quimby—*Field Museum of Natural History*, 50 p., illus., paper, \$1.25. This site consists of two Plaquemine Period mounds.

MINERALS USEFUL TO CALIFORNIA AGRICULTURE—Olaf P. Jenkins, Ed.—*California Division of Mines*, 148 p., illus., \$1.00. Showing how mining and agriculture help one another.

ON THE CLAUSILIDAE OF PALESTINE—George Haas—*Chicago Natural History Museum*, 23 p., illus., paper, 40 cents. These sparsely distributed snails are considered remains of a more moist and possibly cooler era.

PHILIPPINE ZOOLOGICAL EXPEDITION, 1946-1947, NARRATIVE AND ITINERARY—Harry Hoogstraal—*Chicago Natural History Museum*, 84 p., illus., paper, \$1.50. This expedition took

advantage of U. S. Army surplus material and of soldier-scientists who were willing to take their discharges overseas to join the party. For months they collected birds and mammals with only rat traps and two old shotguns.

THE PLANT WORLD: A Text in College Botany—Harry J. Fuller—*Holt*, Rev. ed., 769 p., illus., \$4.75. This edition restores some of the technical material eliminated from the first edition.

REVIEW OF CURRENT RESEARCH AND DIRECTORY OF MEMBER INSTITUTIONS—*Engineering College Research Council*, 244 p., paper, \$2.25. More than 5,200 research projects are now active in 91 institutions.

SCIENCE FRENCH COURSE—C. W. Paget Moffatt, revised by Noel Corcoran—*Chemical Pub. Co.* 4th, ed., 332 p., \$4.75. For students who must read scientific books in French. The necessary minimum of grammar is provided together with a selection of extracts for practice and a vocabulary.

THE SIGNIFICANCE OF HONOR SOCIETIES—George D. Beal—*Mellon Institute*, 4 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

THE TABLE ROCK BASIN IN BARRY COUNTY, MISSOURI—Lee M. Adams—*Missouri Archaeological Society*, 63 p., illus., paper, \$1.00. This first memoir of the Society describes the prehistory of an area that will probably be flooded in the construction of Table Rock Dam.

Science News Letter, July 7, 1951

AERONAUTICS

Varying Sweepback Wings

► WINGS WHOSE degree of sweepback can be altered in flight at the will of the pilot feature the new "flying laboratory," the Bell X-5. It is the first aircraft in which this is possible.

This new airplane is to be used by the National Advisory Committee for Aeronautics to investigate aerodynamic effects of changing the degree of sweepback in flight. It utilizes principles explored by the NACA and the finished product is the result of three years of research by the NACA, the U. S. Air Force and Bell engineers.

Built by the Bell Aircraft Corporation, it is regarded as a successor of the famous X-1. This was the first plane to break the sonic barrier and travel faster than sound. The new version is a speedy craft. More about its possible speed will be known after flight tests are completed. Taxi tests have already been made near Buffalo, N. Y. Flight tests will be made in the near future at Muroc, Calif.

Bell X-5, unlike the rocket-powered X-1, is equipped with a jet engine. It will be able to take off by itself and remain in the air for extended periods. The X-1 had to be carried aloft on the belly of a bomber and, after release, travelled by gravity and its own rocket power. But the rocket power lasted only a matter of a few minutes.

The engine used is the new Allison J-35-A-17 turbo-jet, said to be one of the most powerful jet engines in the world. Both length and wingspan of the X-5 are about 33 feet. Under its long pointed nose, which has a spear-like boom projecting forward, is an open "mouth" which is the intake for the air necessary to operate the engine.

Science News Letter, July 7, 1951

ASTRONOMY

Less Stray Matter Around Jupiter than Near Mars

► INTERPLANETARY TRAVELERS of the future will find fewer stray asteroids, meteors and bits broken off from them around the planet Jupiter to obstruct their journey than in the vicinity of Mars, computations reported by Dr. Fred L. Whipple and Frank J. Kerr of Harvard Observatory to the American Astronomical Society meeting in Washington indicate.

There is not more than three grams of stray matter every ten billion cubic yards near the orbit of Mars, and not more than one-twentieth this much near Jupiter, they told members of the American Astronomical Society.

Science News Letter, July 7, 1951

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MEDICINE

Simple Trichinosis Test

► A SIMPLE, 15-minute test for diagnosing trichinosis has been developed by scientists at the U. S. National Institutes of Health. It may even be adapted for diagnosis of brucellosis, tularemia, or rabbit fever, and certain parasitic diseases besides trichinosis.

Trichinosis, estimated to affect about 16 out of every 100 Americans, is caused by worm parasites called trichina. They get into the body from eating undercooked pork infected with them. Diarrhea, nausea, colic and fever are early symptoms. Later symptoms are stiffness, pain and swelling of the muscles, fever, sweating and insomnia.

The complement fixation diagnostic test used heretofore is time-consuming and requires highly trained laboratory personnel and relatively expensive materials.

The new test is called a flocculation test. Blood serum from the person suspected of having trichinosis is put inside a wax ring on a glass slide. To this is added a special preparation of the trichina called an antigen. The droplets are rotated by an agitating

device for 15 minutes and then examined under a microscope. If the suspended particles are clumped together, the test is positive, meaning the person is infected with the trichina. If there is little or no clumping, it means no infection with trichina.

Scientists who developed the test are: John Bozicevich, Dr. John E. Tobie, Elizabeth H. Thomas, Helen M. Hoyem and Stanley B. Ward.

Success in developing the test depended largely on finding a way to make a stable antigen, or test substance. Bentonite, a fine clay, provided the solution to this problem. An extract, made from larval worms from infected rats, is adsorbed on the bentonite which covers the antigen particles completely.

Once the antigen becomes available commercially, the scientists believe the test can be used widely in large and small hospitals and by physicians or their nurses in their offices. This, it is hoped, will help in bringing the disease under control.

Science News Letter, July 7, 1951

Just write Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the Wood Identification kit.

Science News Letter, July 7, 1951

METEOROLOGY

As Usual, July Will Be Hot Except in Far North

► ONLY REALLY cool place this coming month will be a strip across the northern part of the country, it seems from the U. S. Weather Bureau's Extended Forecast Section's prediction. The 30-day outlook for the month of July calls for temperatures to average below seasonal normals in the northern portions of the Lakes, Plains and mountain states.

But in the southern half of the country temperatures are expected to average above normal with the greatest departures, in other words greatest heat, in the western Gulf states.

Elsewhere near normal temperatures are anticipated.

The southern and western portions of the country are going to be dry, too. Rainfall is expected to be below normal there. Abundant showers are indicated for the Northeast, Midwest and northern plains and near normal rainfall is expected elsewhere.

Science News Letter, July 7, 1951

INVENTION

Food Solids from Fruit Juices by Drying Process

► FREE-FLOWING solids for food are obtained from fruit and vegetable juices by a drying process invented by Sumner I. Strashun, El Cerrito, Calif. The patent awarded to him is 2,557,155. Rights are assigned to the government as represented by the federal Secretary of Agriculture.

Science News Letter, July 7, 1951

DENDROLOGY

Wood Collection in Home

► EVERYBODY HAS a wood collection in his own home. For some this wood is in the form of pencils, toothpicks and kitchen matches; furniture, doors and wooden floors. Others collect wood as a hobby.

The next time you sharpen a wooden pencil, smell the shavings. About 97 of every 100 wooden pencils in America are made of incense cedar, grown in California and Oregon. If you have a toothpick handy, try to mark it with your fingernail. Most toothpicks are made of white birch, a northern hardwood.

White pine is preferred for kitchen matches, approximately half of the Idaho white pine lumber produced each year

going into their production. Rolling pins and bread boards are usually made of hard maple.

Redwood, one of the most durable woods known, makes good outdoor furniture. Some of the redwoods living today, found in a belt 20 miles or so wide along the northern coast of California, were strong young saplings back in 50 B.C.

Half of the world's supply of lumber is produced in the United States. Millions of additional cubic feet of forest products annually go into pulp and paper, veneers, plywood, plastics and rayon.

The United States grows its wood supply on 461,000,000 acres of commercial timberland. This area is twice as great as Texas, the six New England states and West Virginia combined.

Woods differ greatly. Some are so tough they break an axe when you try to chop them down, others are so soft you can mark them with your fingernail. Some are so light they can be used in place of cork in life preservers, others are so heavy that a raft made of them would sink in water.

Samples of hard maple, redwood, Douglas fir and several other types of wood have been collected for you by Science Service, available for the nominal sum of 50 cents in the current unit of Things of science. Some of the tests experts use in identifying wood are suggested in the explanatory leaflet that accompanies the wood specimens.

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❁ **HEATED BLADE** for the windshield wiper, recently patented, contains through its length a small-diameter coil of electric heating wire with one end grounded and the other connected to the car's electric system. The heat keeps both the wiper itself and the windshield clear of ice and snow.

Science News Letter, July 7, 1951

❁ **PENCIL SHARPENER** for draftsmen, for either round or chisel points, can be used also to dress scribe and divider points. A silicon carbide abrasive surface on the inner side of a cylindrical holder replaces long-used sandpaper, and a felt guide wiper cleans sharpened points.

Science News Letter, July 7, 1951

❁ **MEMO PAD** for attaching to the wrist watch strap, on which an American patent was recently granted to a South African, has a backing plate and pages for notes. The plate is curved to fit the back of the wrist; an outer cover, when closed, holds leaves in position.

Science News Letter, July 7, 1951

Do You Know?

The condor has the greatest wingspread of any bird in North America; its soaring flight is one of the most spectacular sights in nature.

Key deer of Florida islands, approaching extinction, are sometimes called "pigmies," being less than 30 inches in height and weighing less than 35 pounds.

The common skunk usually has five young in a litter.

Calcium, associated with phosphorus and magnesium, is the major mineral in teeth and bones.

A lightning stroke is not just one big electric spark but includes many over the same path.

There are 13 different minerals regarded as essential in man's diet for normal life and health.

The next eclipse of the sun visible in the United States will be on Sept. 1, 1951.

Millions of synthetic sapphires are used each year for bearings in precision instruments.



❁ **PLASTIC AIRPLANE** model, for a youngster on a long automobile trip, is mounted outside the car as shown in the photograph. It is fastened to the end of a rod which passes through a clamp fitted on the top of a lowered window. With an inside handle, the toy plane can be put through climbing, diving and spinning maneuvers.

Science News Letter, July 7, 1951

❁ **SPECIAL RUBBER** lining for closet and pantry shelves provides a cushioned base that stops glassware chipping and aids

sanitation, being easily cleaned. Underside ribbing anchors the lining in place, while a slightly elevated lengthwise rib at the rear holds plates in upright position.

Science News Letter, July 7, 1951

❁ **PORTABLE AUDIOMETER**, developed by the Army Medical Center, Walter Reed Hospital, can test the hearing ability of 50 persons simultaneously in from 30 seconds to four minutes. Utilizing a constant sound level with variation in frequency, the range of test tones not heard indicates relative loss of hearing ability.

Science News Letter, July 7, 1951

❁ **SURFACE-SCANNING** radar, under tests at the London, England, airport, enables its operator in bad weather to "see" on its screen all surface traffic on the field, including taxiing planes, automobiles and pedestrians. It may be mounted on a mobile truck or in an airport control tower.

Science News Letter, July 7, 1951

❁ **MULTIPLE-DOSE** injection apparatus, to force vaccines or medications through the skin without needle or incision, permits treatments to a large number of persons in a short time. Two models are under testing, one hand-cocked, the other operated by a two-cylinder pump.

Science News Letter, July 7, 1951

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